

REMARKS

This Amendment is responsive to the prematurely Final Office Action of March 9, 2010. Reconsideration and allowance of claims 13, 16, and 19-27 are requested.

The Office Action

Claim 13 stands rejected under 35 U.S.C. § 112, second paragraph.

Claims 12, 16, 19, and 20 stand rejected under 35 U.S.C. § 103 over Lau (US 6,066,168) in view of Pacetti (US 2002/0188345).

**The Present Amendment
Should Be Entered**

The present amendment should be entered on the basis of fairness to the application and to complete the record on appeal.

The present Office Action responds to the Notice of Appeal and the non-substantive amendment which corrected two antecedent basis errors by making three new grounds of rejection. First, the Examiner issued a new 35 U.S.C. § 112, second paragraph, rejection against claim 13 concerning language which had been in the claim since before the Final Rejection of June 25, 2009. Second, the Examiner makes a new ground of rejection against claims 16, 19, and 20. In the Amendment accompanying the Appeal Brief, a single word was replaced with its synonym for consistent word usage throughout the claim. It did not change the scope of claim 16. Third, the Examiner issued a new ground of rejection against claim 12. However, since claim 12 was previously cancelled, this rejection is academic.

The Examiner also took another new stand by withdrawing previously presented and examined claim 21, now alleging that it was directed to a different invention from the other previously presented and examined claims. The applicant cannot petition this holding without first requesting reconsideration, which is here being done. However, due to the Finality of the rejection, it is not reasonable to expect that this petition process can be completed prior to an allowance of the application or a second Appeal to the Board of Appeals.

It is further submitted that the present amendment should be entered because the Finality of the March 9, 2010 Office Action is premature.

Finally, it is submitted that this amendment should be entered as placing the application in condition for allowance.

The Finality of the Present Office Action
Is Premature

The Appeal Brief is analogous to a Request for Reconsideration. The Amendment which accompanied the Appeal Brief presented no arguments and made no substantive amendments. Rather, the Amendment accompanying the Appeal Brief reduced the issues on Appeal by resolving two 35 U.S.C. § 112, second paragraph issues, one of which had been requested by the Examiner in the Final Rejection and the other of which the Examiner had not noted. The Amendment accompanying the Appeal Brief made no substantive amendments and did not change the scope of the claims, particularly in a manner which would have necessitated a new ground of rejection.

Yet, the Examiner issued three new grounds of rejection, none of which were necessitated by the Amendment accompanying the Appeal Brief.

First, the Examiner noted a § 112 issue in language of claim 13 that had been in claim 13 since before the Final Rejection. This ground of rejection could and should have been raised earlier.

Second, the Examiner made a new ground of rejection against claims 16, 19, and 20. This new ground of rejection was not necessitated by the Amendment accompanying the Appeal Brief. The Examiner fails to link the new ground of rejection in any way to the correcting of the use of “ring” with its synonym “loop” in claim 16 for consistency with line 6 of claim 16, line 2 of claim 19, and line 2 of claim 20. The Examiner fails to link the alleged necessity for the new ground of rejection in any way to the change of language from “ring” to “loop”.

Third, the Examiner issued a new ground of rejection against claim 12. However, claim 12 had been previously cancelled.

Because the new grounds of rejection were not necessitated by the Appeal Brief which made no amendments to the claims or by the Amendment which accompanied the Appeal Brief which addressed only antecedent basis issues, it is submitted that the Finality of the Office Action of March 9, 2010 is premature and should be withdrawn.

Constructive Election

It is submitted that claim 21 is not drawn to an independent and distinct invention relative to claims 13 and 16. To emphasize the interrelationship of claim 21 to the other pending claims, the applicant has added new claims 22-27 which add the structures defined in claim 21 to the structures defined in claims 13 and 16 by way of a series of dependent claims.

These new dependent claims further restrict claims 13 and 16 from which they depend and emphasize that the alleged differences in the claims relate to a variation in scope rather than restrictable inventions.

The applicant hereby requests reconsideration of the Examiner's withdrawing of claim 21 on the alleged grounds of Constructive Election. It is requested that the Examiner continue to consider claim 21 and, because it distinguishes patentably over the references of record, allow it.

**The Claims Are Now in Condition
For Allowance**

Claim 13 has been amended to correct the 35 U.S.C. § 112, second paragraph issue raised by the Examiner. There being no rejection against claim 13 on art, it is submitted that claim 13 and claims 22-24 dependent therefrom distinguish patentably and unobviously over the references of record.

The combination of Lau and Pacetti do not render the construction of **claim 16** obvious. Lau is representative of the acknowledged prior art and evidences all of the problems which Pacetti and the present application look to overcome. In magnetic resonance imaging, a series of high power RF pulses are applied to induce and manipulate magnetic resonance. These RF pulses induce eddy currents in electrically conductive loops in metal structures within the RF field. The electrically conductive structure offers resistance to this eddy current, which resistance converts the induced electrical currents into heat. The induced eddy currents also interfere with the magnetic resonance signals and reduce the efficacy of the magnetic resonance imaging sequence. Due to the high power and large number of the RF pulses, the heating from the conductive loops can be so high that tissue touching the loops suffers burns.

Pacetti and Lau appear to be from the same company and disclose stents of substantially identical construction, with two exceptions. Both disclose a series of longitudinal bars (13 in Lau and 50 in Pacetti) which are disposed longitudinally on the surface of a cylinder. These bars are interconnected by radially expandable elements 12 of Lau and 49 of Pacetti. In Lau, the radially expandable elements are generally S-shaped; whereas, in Pacetti, the radially expandable elements are generally V-shaped. Pacetti also recognizes that he can break up the electrically conductive loops by creating a discontinuity 52 in the radially expandable elements 49. The breaks in the conductors are positioned such that no electrically conductive loops are defined. When there no conductive loops, eddy currents are not induced. Once one incorporates the breaks 52 into the radially expandable elements of Lau, the stents of Lau and Pacetti are structurally identical, except that the radially expandable elements in one are S-shaped and in the other are V-shaped.

Contrary to the Examiner's assertion, Pacetti does not disclose non-conductive or insulating nodes, but rather discloses electrical discontinuities 52 in radially expandable elements, which discontinuities or gaps can be filled with a non-conducting material. The discontinuities of Pacetti eliminate electrically conductive loops of Lau which extend around the central axis of the stent. The loops and linking members of Lau as modified by Pacetti are not connected within non-conductive connector nodes.

The Examiner refers to two MR patents which are cited on the Notice of References Cited but which have no logical nexus to the Pacetti or Lau patents. Neither addresses or relates to the imaging of stents. Cheng discloses an improved metal composition for the pole pieces of a C-type or open MRI imager. Morich is directed to a construction for reducing the forces between a gradient coil and the rest of the magnet system. The magnetic field gradient pulses of an MR sequence apply forces that try to move the gradient coil causing undesirable stresses and noises. Neither is concerned with refinements to magnetic resonance imaging systems for the improved imaging of stents.

Indeed, magnetic resonance imaging has been known since at least 1973. See, P.C. Lauterbur, "Nature", v. 242, p. 190-191 (1973). Although the patent committee at Dr. Lauterbur's employer, S.U.N.Y. at Stony Brook did not recognize

the value of this invention and although the article had to be resubmitted to Nature before they recognized its merits and published it, many diagnostic imaging companies did recognize the value. From 1973 to the present, there have been a steady stream of patented improvements in magnetic resonance imaging technology.

The applicant respectfully traverses the Examiner's assertion that it is well-known in the art to use MRI imaging when deploying stents. To the contrary, C-arm x-ray fluoroscopy imagers are generally used for deploying stents. When deploying a stent, a catheter, with the stent adjacent its end, is inserted through a port in the patient's leg. The surgeon inserts progressively more and more of the catheter, causing the stent end of the catheter to move through the patient's vascular network toward the heart. From time to time, the surgeon injects a small amount of radioopaque dye through the catheter while a 2D x-ray fluoroscopic projection image is generated. The 2D x-ray fluoroscopic image gives faint outlines of vessels, but the radioopaque dye causes the vessels immediately downstream from the end of the catheter to turn black. This periodic checking of the route with radioopaque dye enables the surgeon to navigate the stent to the location of the blockage, often in vessels which feed the heart. For inserting a stent in a carotid artery, the stent end of the catheter typically needs to pass from the veins to the arteries, e.g., through the heart, and continue on its journey. The x-ray opaque dye and the C-arm fluoroscopic imager are also used to verify the location of the blockage. When the radioopaque dye is injected, a vein region with partial blockage will appear very narrow. In the case of total blockage, the vessel will appear to terminate at the blockage. The C-arm radiographic device is further used to verify the placement, insertion, and proper deployment of the stent.

One of the reasons why C-arm x-ray equipment is used instead of MRI for inserting stents is cost. The stent operation takes an extended period of time, e.g., a couple of hours. The amortized cost of a couple of hours of a relatively inexpensive C-arm x-ray device is low when compared to the amortized cost of a multi-million dollar MRI imaging system. Moreover, a C-arm x-ray imaging system can be operated by the surgeon merely by depressing a foot pedal to generate the image. The MRI scanner is typically operated by a well-paid MRI technician.

Another reason why C-arm x-ray devices are utilized is that an MRI scanner images hydrogen dipoles, e.g., water. The stent and catheter of Lau or Pacetti is visible in an x-ray image, but are virtually invisible in an MRI image.

The Examiner further asserts that it would have been obvious to place the breaks of Pacetti anywhere through the stents of Lau. The applicant disagrees. The stents of Lau and Pacetti are structurally the same (except for the V-shape and S-shape connecting elements). Pacetti spells out very specifically where the breaks are to be located, i.e., such that no conductive loops are defined. It is submitted that the breaks would be located in the same place in the S-shaped radial expandable elements of Lau as in the V-shaped radial expandable elements of Pacetti. That is, the final construction would look just like Pacetti, except that the radially expandable elements would be more S-shaped than V-shaped.

The Examiner asserts that this would enhance the stent in MRI imaging. To the contrary, the stent, often an aluminum alloy, not visible in MRI imaging.

Contrary to the drawing on page 5 of the Office Action and the Examiner's assertion, placing the breaks **52** in the locations instructed by Pacetti would destroy all electrically conductive loops, including loops on the surface of the cylinder as well as loops around the cylinder. Pacetti deploys the breaks such that there are no electrically conductive loops, hence no induced eddy current flow. There being no current flow in the Pacetti stent or the Lau stent as modified by Pacetti, there are no currents to cancel each other. Nor are there any loop currents, much less loop currents arranged to cancel each other. In Pacetti, there is no current flowing in loops, much less currents flowing through adjacent loops, much less current flowing such that currents flowing through adjacent loops substantially cancel each other.

The Examiner directs the applicant's attention to Figure 11 of Lau. Figure 11 of Lau is the same as Figures 1-5, except that the radially extendable elements have more S's between the bars **13** which extend longitudinally on the surface of the cylinder. Figure 11 of Lau, like the other Figures of Lau, would have no electrically conductive loop extending around the longitudinal axis of the stent once modified to include the electrical breaks **52** of Pacetti.

Claim 16 calls for a plurality of electrically conductive struts that are connected by a plurality of insulating nodes to define a diamond-shaped mesh of conductive struts. There are no insulating nodes in Lau. The breaks **52** in the radially expandable elements of Pacetti do not connect electrically conductive struts to define a diamond-shaped mesh. The breaks of Pacetti (both in Pacetti and Lau as modified by Pacetti) do not connect struts to define a diamond-shaped mesh.

Claim 16 calls for the conductive struts to be electrically connected to define a plurality of loops in a zig-zag pattern extending peripherally around the cylinder. When the breaks **52** of Pacetti are installed into the radially expandable elements of Lau, electrical conductivity is broken such that there are no electrically conductive loops.

Claim 16 further calls for the loops to be connected such that currents induced in the zig-zag loops flow in opposite directions and substantially cancel each other. In Lau as modified by Pacetti to include breaks to prevent current from flowing in loops. There is no induced eddy current flow in loops, much less current flow in opposite peripheral directions in loops which extend peripherally around the cylinder.

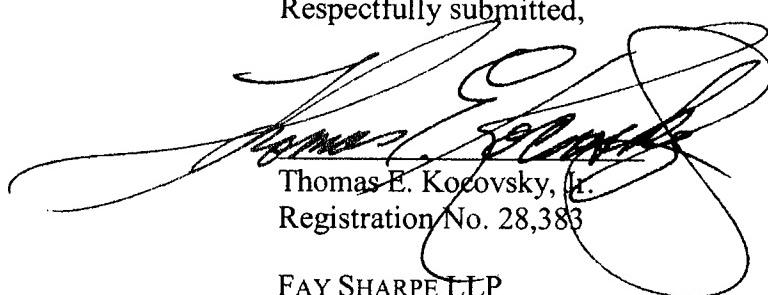
Accordingly, it is submitted that claim 16 and claims 19, 20, and 25-27 dependent therefrom distinguish patentably and unobviously over the references of record.

CONCLUSION

For the reasons set forth above, it is submitted that the Constructive Election holding should be reversed and that claim 21 should continued to be examined, and that claims 13, 16, and 19-27 distinguish patentably and unobviously over the references of record and comply with all other statutory requirements. An early allowance of all claims is requested.

In the event the Examiner considers personal contact advantageous to the disposition of this case, the Examiner is requested to telephone Thomas Kocovsky at 216.363.9000.

Respectfully submitted,



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